

Claims

1. (CURRENTLY AMENDED) A nozzle for the injection of fluid into a molding chamber comprising:

a hollow passage having a distal end for connecting a pressurized fluid supply to the interior of said chamber; and

a pin extending through said passage and reciprocal between an extended position and a retracted position, said pin having an enlarged distal portion substantially blocking said passage when said pin is in its retracted position, and having a pressure surface on said distal portion exposed to pressurized fluid supplied via said passage, [said pin being] wherein said pin is urged from its retracted position to its extended position when said pressure surface is exposed to pressurized fluid via said hollow passage [reciprocable between its extended and retracted positions with fluid at said pressure surface]; and

an actuator operably coupled to a proximal end of said pin, said pin being reciprocable between its extended position and retracted position with said actuator[; and

said actuator operable to reciprocate said pin in cooperation with said pressurized fluid].

2. (ORIGINAL) the nozzle of claim 1 wherein said passage has a tapered inner diameter at its distal end and said enlarged portion of said pin has a substantially mating tapered contour.

3. (ORIGINAL) The nozzle of claim 1 wherein said pin is hydraulically reciprocated.

4. (ORIGINAL) The nozzle of claim 1 wherein said pin is reciprocated by an electromagnetic actuator.

5. (ORIGINAL) The nozzle of claim 1 further comprising means for biasing said pin into said retracted position.

6. (ORIGINAL) The nozzle of claim 1 further comprising a ball screw drive for reciprocating said pin.
7. (CURRENTLY AMENDED) A gas assisted injection molding apparatus comprising:
- a molding chamber;
 - a supply of pressurized gas;
 - a hollow conduit communicating with said gas supply and extending into said chamber;
 - a pin extending through said conduit and reciprocal between an extended position and a retracted position, said pin having an enlarged distal portion substantially blocking said conduit at said retracted position; and said pin urged from said retracted position when pressurized gas is supplied to said enlarged distal portion;
 - an electronic actuator operably coupled to said pin;
 - said pin being reciprocable independently of said gas with [one or more of gas pressure at said enlarged distal portion and] said electronic actuator.
8. (ORIGINAL) The apparatus of claim 7, further comprising an electronic controller connected to said electronic actuator for controlling reciprocation of said pin.
9. (ORIGINAL) The apparatus of claim 7, further comprising means for biasing said pin in said retracted position.
10. (ORIGINAL) The nozzle of claim 7 wherein said conduit has a tapered inner diameter at its distal end and said enlarged portion of said pin has a substantially mating tapered contour.
11. (CURRENTLY AMENDED) A nozzle for the injection of fluid into a molding chamber comprising:
- a hollow passage having a first end for connecting a pressurized fluid supply to the interior of said chamber;

a pin extending through said passage and reciprocal between an extended position and a retracted position;

a first end of said pin having an end portion with a first pressure surface, said end portion matingly received by said first end of said passage, substantially blocking said passage at said retracted position;

a second end of said pin includes a second pressure surface, said second end extending into a variable pressure fluid reservoir;

wherein said pin can extended or retracted by [any of]: adjusting fluid pressure at said first pressure surface only, adjusting fluid pressure at said second pressure surface only, or adjusting fluid pressure at both of said first and said second pressure surfaces.